

User manual

18.6.2009
Firmware V2.0

2011KCI 2211KCI Weighing display



Nokeval

INTRODUCTION

2011KCI and 2211KCI are input cards specially designed for Konecranes. They can be placed in any of Nokeval E and F series large displays, like 1000F4.

The card provides one (2011KCI) or two (2211KCI) 2-8 V analog input channels. The upper end of

these can be scaled freely, and independently on each channel.

These models have been superceded by 2012KCI in spring 2007.

A separate Technical manual is available on request, covering more details of the KCI displays.

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ORDERING

Ordering

Obsolete

It is recommended to replace the 2011KCI and 2211KCI by more advanced 2012KCI, which has been available since spring 2007.

Order code

Example: 1000F4 – 2011KCI – 230VAC

The order code consists of several parts. The first part describes the large display type, the next part defines the input card type, and the last part selects the supply voltage.

Large display type

Nokeval has four cases for large field displays. These are:

575 Five 57 mm digits, plastic enclosure
1000 Three to four 100 mm digits, steel
1100 Five to six 100 mm digits, steel
1800 Three to five 180 mm digits, steel

The letter after the case size is either E or F. This tells the type of the internal electronics. They are principally the same but have different looks. The main difference is that the input card is upside down in the E chassis. Since beginning of year 2003 all displays have been with F chassis.

The number after the letter defines the number of display digits.

Input card type

These large displays use Nokeval 2000 series input cards. Custom input cards 2011KCI and 2211KCI have been designed for KCI.

Power supply options

Before summer 2009, the large field displays have been available with three power supply options:

Name	Voltages
-24VDC	24 VDC
-48VAC	48 VDC or VAC
-230VAC	115 or 230 VDC or VAC

After summer 2009, the input voltage range of the 230 VAC model has been extended to cover the range 41...265 VDC/AC, removing the need for a separate 48 VAC model. The voltage options are:

Name	Voltages
-24VDC	24 VDC
-48/230VAC	48, 115, or 230 VDC or VAC

Common models

1000F4-2011KCI-48/230VAC: four 100mm digits, 1 input, power 48 to 230 VAC.

1000F4-2211KCI-48/230VAC: four digits, 2 inputs, power 48 to 230 VAC.

Spare parts ordering

Spare input card:
2011KCI-IN
2211KCI-IN

Spare electronics unit including input card:
SP-EL2011KCI-48/230VAC (or whichever supply and cards)

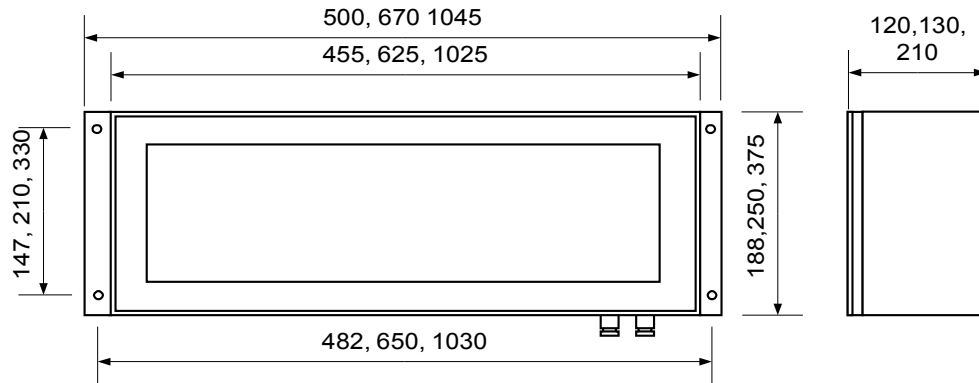
Spare ribbon cable from el unit to large digits:
SP-CA-EL1000F

Spare large digit:
SP-100DISP (100 mm digit)

INSTALLING

Mounting

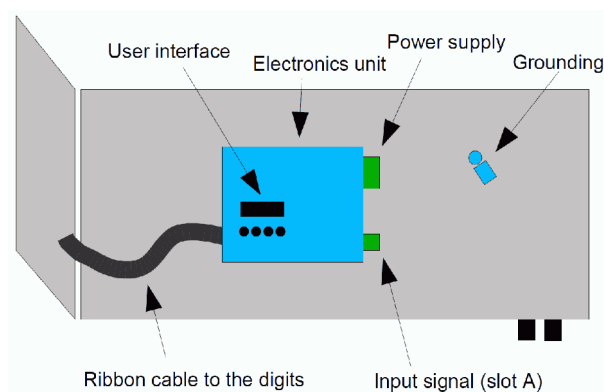
Dimensions for 1000F, 1100F, and 1800F:



Opening the case

To access the electrical connections and the small user interface used for configuring the unit, the steel case has to be opened. First unscrew all the screws surrounding the display, then lift off the black steel frame and the red plexiglass. Finally unscrew the screw that is located on the right hand side of the rightmost digit. Now the display assembly may be turned away on its hinges.

Inside the main case

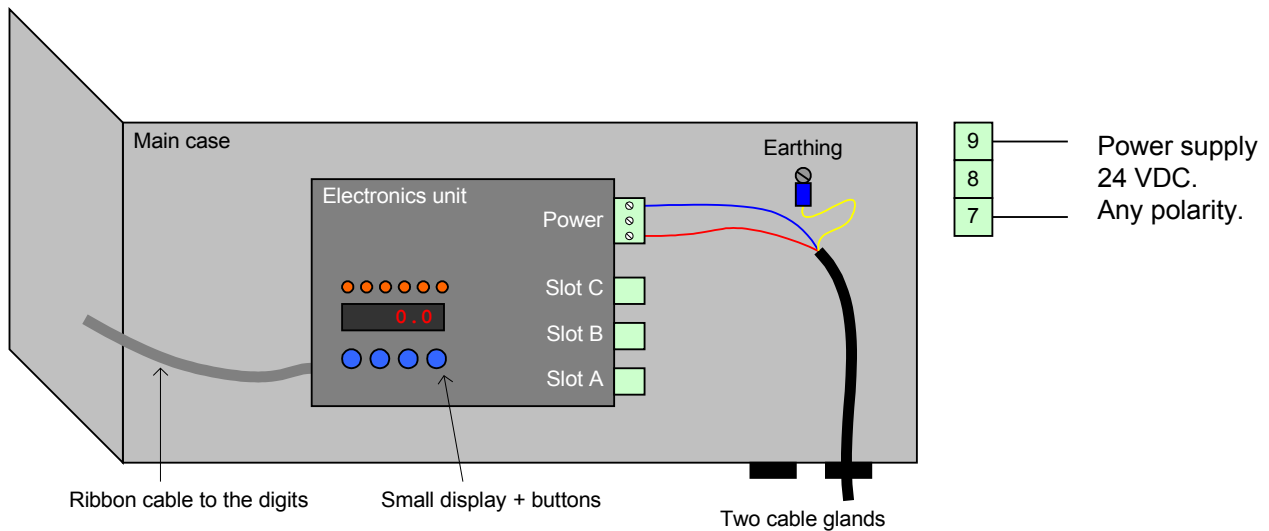


The electronics unit

The electronics unit may be opened or detached from the case. To open it, unscrew the four M3 screws that are holding the cover on its corners. If the unit has to be detached, unscrew the other screws on its top and bottom sides. Normally there is no need to open the electronics unit. **Caution! Opening the electronics unit exposes parts carrying lethal voltages on units powered with more than 24 V supply!**

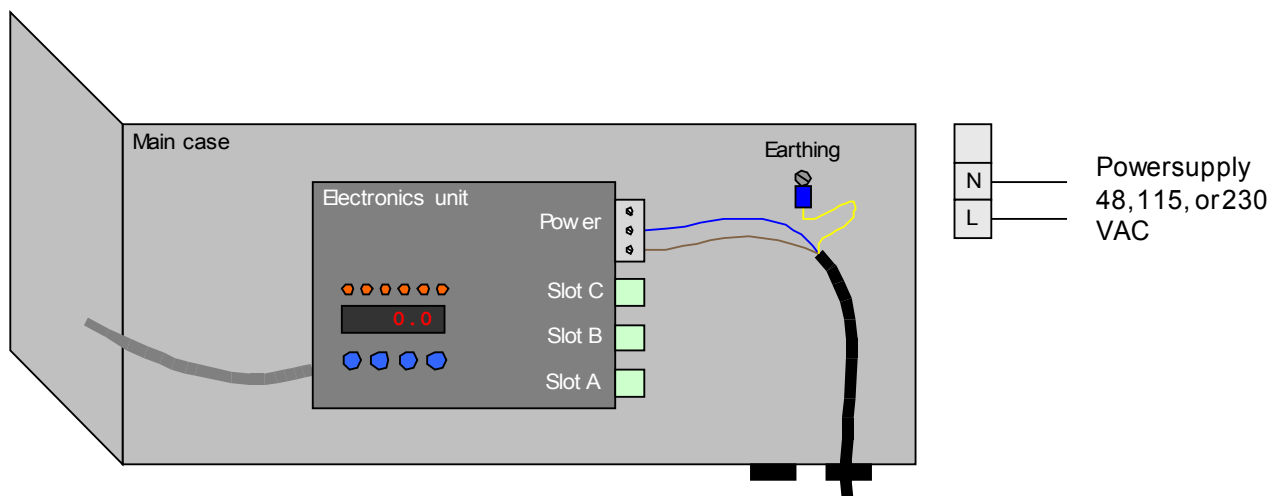
Supply voltage and earthing

24VDC models



Bring the supply voltage to the connector indicated in the picture. If the supply voltage is more than 24 V, the enclosure must be reliably earthed using the M4 screw provided. A pre-fuse is not necessary, but if one is used, it should be at least 2 AT.

48/230VAC models



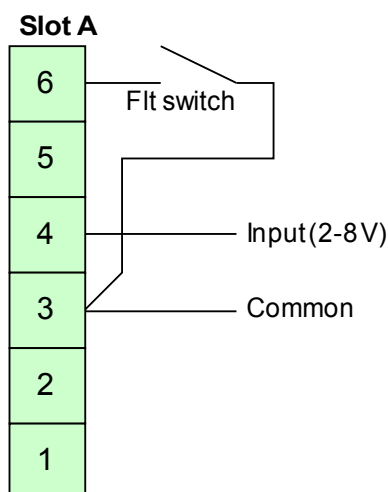
Bring the Live and Neutral wires to the electronics unit as in picture. A pre-fuse is not necessary, but if one is used, it should be at least 1 AT.

Connect the Protective Earth wire to the M4 screw using the Faston connector provided - a Faston crimping tool is needed.

For electrical safety, the power and signal wires must be fastened using cable ties or equivalent so that if one signal wire is detached, it can not touch any of the power supply wires, or vice versa.

Signal connections

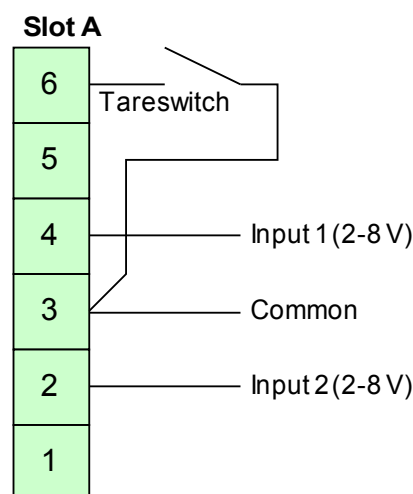
2011KCI



Bring the input signal in slot A terminal 4 and its common in terminal 3.

Connect a potential-free switch between 6 and 3 to use the "Flt" function (when the switch is closed, the display will show "Flt" instead of the reading).

2211KCI



The 2-8 V analog signals are connected in slot A terminals 4 (channel 1) and 2 (channel 2). The common wire is connected in terminal 3.

Connect a potential-free switch between 6 and 3 to use the Tare function.

Configuring

The display unit may be configured either on the small display and buttons inside the main case, or with a programming cable.

Inside buttons

Open the main case as explained above. Use the small display and four buttons to configure the display unit. Using the buttons is explained in chapter User interface.

Via a programming cable

Using the programming cable is possible only on models equipped with circuit board "2012" in slot A.

The programming cable is attached to a pin header marked "POL" on the input card in slot A. To

access it, both the main case and the electronics unit cover have to be opened. **Removing the electronics unit cover exposes parts carrying lethal voltages on units with supply voltage more than 24 volts!**

Nokeval provides two alternative programming cables: "POL-RS232" for RS-232 port, and "DCS772" for USB port.

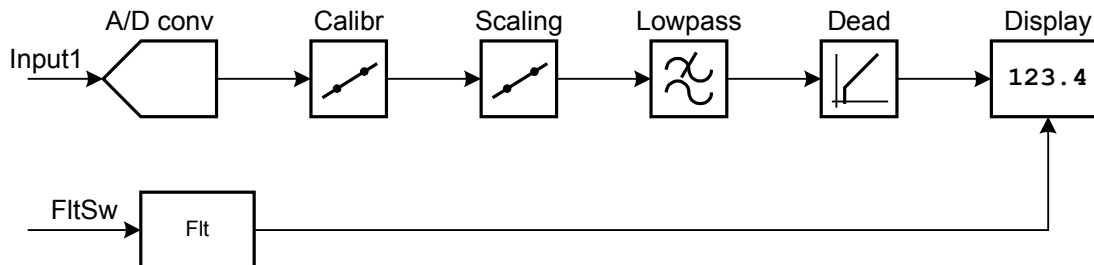
In addition, an adapter for the pin header, called "POL-3PIN", is required.

A free software MekuWin is used, available for Microsoft Windows. Select SCL protocol, 9600 baud, and address 0 or 126.

For the configuration menu contents, refer to the chapter User interface.

OPERATION

2011KCI



Input processing

The input is measured using an analog-to-digital converter. The reading is scaled to a weighing reading using the Lo and Hi setting in the configuration menu. When the input signal is 2.00 V, the display will indicate the Lo value, which is almost always set to 0. At 8.00 V input, the display will indicate the Hi value. The measurement unit can be freely selected (kg, ton, lbs...), and there is no need for the display unit to know it.

How many digits are displayed after the decimal point, is defined with the Dec setting in the configuration menu. The Dec setting can also be used to show fixed zeros, which is useful when displaying large readings (e.g. 10000 kg) and the last digits would otherwise be nervous.

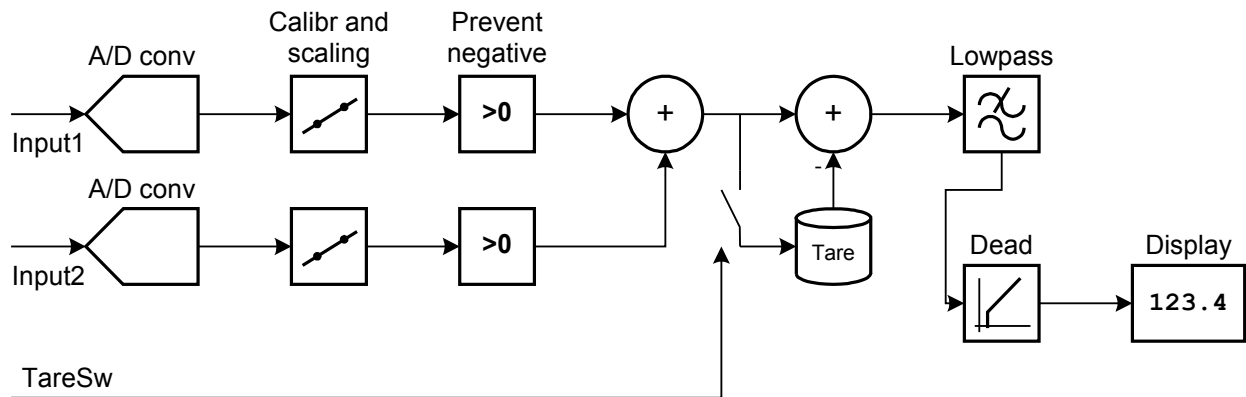
The display can be slowed down with a digital 3rd degree lowpass filter.

The Dead setting can be used to round small readings to zero, or to prevent negative readings

Flt switch

The input card 2012KCI has one digital input. Closing a switch connected to it will make the display to show "Flt" (except in Remote state).

2211KCI input processing



Each 2 to 8 V input signal is scaled to weighing reading using the Lo, Hi 1, and Hi 2 settings in the configuration menu. Lo is almost always 0, and Hi 1 and Hi 2 correspond to the full scale weighs of the input channels. The unit of the scaling can be freely selected (kg, ton, lbs...) and there is no need for the display to know it. Then, negative readings

are prevented (limited to 0), before summing up the readings. A tare value is subtracted. A new tare value can be stored using an external switch.

The 3rd order lowpass filter can be used to attenuate fluctuations and disturbances. The filter is bypassed a couple of seconds after power-up.

USER INTERFACE

This chapter describes how to use the small display and buttons inside the display unit to perform configuration. The contents of the configuration menu is described here too.

The small display inside the case and the large display always show the same contents, except

that the large display may have less than 6 digits and then it shows dashes if the content does not fit.

The displays may be in the following states:

- Normal state – displaying the readings.
- Configuration state – changing the settings.

Normal state

After power-up, the unit is in the normal state, displaying the input readings according to the configuration.

The A3 indicator LED is lit when the external switch controlling the FLT or Tare function is active.

The tare function can be used also by pressing the * key, and the tare value can be reset by pressing * and ► together (2211KCI only).

Configuration state

Entering

Press the * and ▲ keys simultaneously two seconds in the normal state to enter the configuration state. When entered, the Conf led will light.

Navigating

Use the ▲▼ keys to browse the menu. To see a configuration value and possibly edit it, push the ► key. Return to the menu with the * key.

Editing

Integer values, such as the Dec setting, are adjusted with the ▲▼ keys.

Floating point values, such as scaling and the lopass filter, are edited with ▲▼► keys: select digit to edit (blinking) with ► and change it with ▲▼. When the decimal point is blinking, it can be moved with ▲▼. The first digit can be replaced with a minus sign.

Exiting

When all settings are done, exit from the configuration menu with * key. Two options are shown: Save to keep the settings made, and Undo, to discard all changes. Select ▲▼ Save or Undo and push ►. (Or push * to get back to the menu.)

2011KCI configuration menu

Dec	Number of digits after the decimal point. E.g. with value of 1, the reading is displayed with one digit after the decimal point. If the dec setting is negative, the corresponding number of last digits is rounded to zero. Example: Dec= -2, the display will step 0, 100, 200...
Lo	Displayed reading at the minimum input signal (2 V). Almost always 0.
Hi	Displayed reading at the maximum input signal (8 V).
Lopass	Damping, will slow down display fluctuations. Set the time constant (63% of the final change) in seconds. Fast operation = 0.

Dead	Dead zone around zero. Dead>0: Display readings smaller than Dead are rounded to zero. Dead=0: Negative readings are prevented. Dead<0: Both positive and negative readings are displayed.
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2211KCI configuration menu

Dec	Number of digits after the decimal point. E.g. with value of 1, the reading is displayed with one digit after the decimal point. If the dec setting is negative, the corresponding number of last digits is rounded to zero. Example: Dec= -2, the display will step 0, 100, 200...
Lo	Offset that is added to the display reading. May be negative. Almost always 0.
Hi 1	Displayed reading at the maximum input signal on channel 1.
Hi 2	Displayed reading at the maximum input signal on channel 2. When there is a signal on both channels, the sum is displayed.
Lopass	Damping, will slow down display fluctuations. Set the time constant (63% of the final change) in seconds. Fast operation = 0.
Dead	Dead zone around zero. Dead>0: Display readings smaller than Dead are rounded to zero. Dead=0: Negative readings are prevented. Dead<0: Both positive and negative readings are displayed.
Tare	Tare value that is subtracted from every reading. Mainly for viewing, but can be edited too.

SPECIFICATIONS

Analog inputs 2011KCI/2211KCI

Nominal signal	2 to 8 VDC		to a voltage more than 50 VAC or 120 VDC with respect to ground.
Measmt range	-1...11 V or wider		
Calibr accuracy	±5 mV		
Thermal drift	±1 mV/°C		
Overvolt protect	±32 VDC/VAC line-to-line	Max cable length	30 m
Overvolt category	Not rated; analog and digital inputs must not be connected	Sample rate	4 Hz each channel

Power supplies

24VDC model

Nominal voltage	24 VDC
Voltage range	20.4...32 VDC
Power	<15 W
Pre-fuse	≥2 AT; not required

48/230VAC model

Nominal voltage	48, 115, or 230 VAC
Voltage range	41...265 VAC or VDC
Frequency	45...65 Hz
Power	<25 W
Pre-fuse	≥1 AT; not required
Protection	Class 1

Enclosure

Dimensions	See chapter Installing	Protection	IP65
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Regulations

EMC immunity EN 61326

ESD	61000-4-2, 4 kV contact, criterion B
EM field	61000-4-3, 10 V/m, criterion A; analog inputs may deflect 0.1% of range
Burst	61000-4-4, any port: 2 kV, criterion B
Surge	61000-4-5, power supply: 1 kV line-to-line, 2 kV line-to-ground, criterion A
Conducted RF	61000-4-5, signal ports: not applied (short-distance wires) 61000-4-6, any port: 10 V, criterion A; analog inputs may deflect 0.1% of range

Electrical safety EN 61010-1

EMC emission EN 61326

RF emissions	CISPR 16 class A
AC mains	CISPR 16 class A